

III. CLAIM AMENDMENTS

1. (Currently Amended) A method for detection of a target nucleic acid sequence ~~(1A)~~ in a mixture of different nucleic acids ~~(5)~~ having additional binding sites ~~(10)~~, the method comprising the subsequent steps:

A) hybridizing the target nucleic acid sequence with a probe ~~(15)~~ in liquid phase, the probe having a first label ~~(20)~~,

A1) hybridizing the additional binding sites with single stranded nucleic acids having random primary sequences in liquid phase,

B) separating the different nucleic acids ~~(1A, 5)~~,

C) detecting the target nucleic acid ~~(1A)~~ by using the labeled probe ~~(15)~~.

2. (Cancelled)

3. (Currently Amended) Method according to claim 2~~1~~,

- wherein short nucleic acids having a length of 6 to 12 nucleotides are provided in ~~step A1~~ for hybridizing.

4. (Currently Amended) Method according to claim 2-1~~or 3~~,

- wherein hybridizing in ~~step A1~~ is carried out at roughly room temperature, and
- hybridizing in ~~step A~~ is carried out at a temperature between 56°C to 72°C.

5. (Currently Amended) M~~method~~ according to claim 2-1~~or 3~~,

- wherein a nucleic acid with a length of at least 10-times the length of the single stranded nucleic acids ~~(25)~~ with random primary sequence is used as a probe ~~(15)~~,
- wherein ~~step A1~~ and ~~step A~~ are carried out simultaneously.

6. (Currently Amended) Method according to claim 3-2~~or any of the claims 4 or 5~~,

- wherein in ~~step A1~~ nucleic acids ~~(25)~~ labeled with a second label ~~(30)~~ are used for hybridizing,

- the second label ~~(30)~~ being different from the first label ~~(20)~~.

7. (Currently Amended) Method according to claim ~~3~~ 2 ~~or any of the claims 4 or 5,~~

- wherein the nucleic acids ~~(25)~~ used for hybridizing in ~~step A1~~) are subsequently labeled with a second label ~~(30)~~ after ~~step A1~~),
- the second label being different from the first label.

8. (Currently Amended) Method according to claim 1 ~~or any of the claims 2 to 7,~~
comprising at least one of:

- ~~wherein prior to step A)~~ the mixture of different nucleic acids is denatured in a ~~step A2)~~;
- in A) a nucleic acid is used as a probe, having a stretch of 18 to 25 nucleotides being able to hybridize with the target nucleic acid sequence, this stretch having at least 80% sequence homology to the complementary sequence of the target nucleic acid sequence.

9. (Cancelled)

10. (Currently Amended) Method according to claim ~~1~~ ~~or any of the claims 2 to 9,~~
comprising at least one of:

- ~~wherein in step B)~~ the nucleic acids are separated according to their mass by using a gel electrophoresis;
- in B) a microfluidic chip having capillaries suitable for nucleic acid electrophoresis is used for separation.

11. (Cancelled)

12. (Currently Amended) Method according to claim ~~1~~ ~~or any of the claims 2 to 11,~~

- wherein a first and if present a second label is used, each being selected from the following group:
- radioactive labels, fluorescent markers, chemoluminescence, bioluminescence, magnetic labels and antigen labels.

13. (Original) Method according to claim 12,

- wherein fluorescent markers are used as the first and if present second label,
- the fluorescent markers of the first and second label emitting radiation of different wavelengths.

14. (Currently Amended) Method according to claim 13,

- wherein in ~~step C~~) the amount and the size of the hybrid strand of the target nucleic acid ~~(1A)~~ and the probe ~~(15)~~ is determined via the first label ~~(20)~~ and in case the second label ~~(30)~~ is present, the amount of the other different nucleic acids ~~(5)~~ in the mixture is determined via the second label ~~(30)~~,
- using a spectrometer for the detection of both labels.

15. (Currently Amended) A kit for performing a separation method according to ~~claim 2 or any of the claims 3 to 7~~claim 1, comprising:

- a probe ~~(15)~~ labeled with a first label ~~(20)~~, able to hybridize with a target nucleic acid sequence ~~(1A)~~,
- oligonucleotides ~~(25)~~ with a randomized primary sequence for hybridizing to the additional binding sites ~~(10)~~ present in the mixture of nucleic acids,
- a mass separator means for carrying out the separation of nucleic acids according to their mass.

16. (Currently Amended) Kit according to ~~the previous claim 15, comprising at least one of:~~

- ~~wherein the mass separator means for carrying out a separation of the nucleic acids include comprises a microfluidic chip;~~
- a second label for labeling the oligonucleotides with randomized primary sequence.

17. (Cancelled)